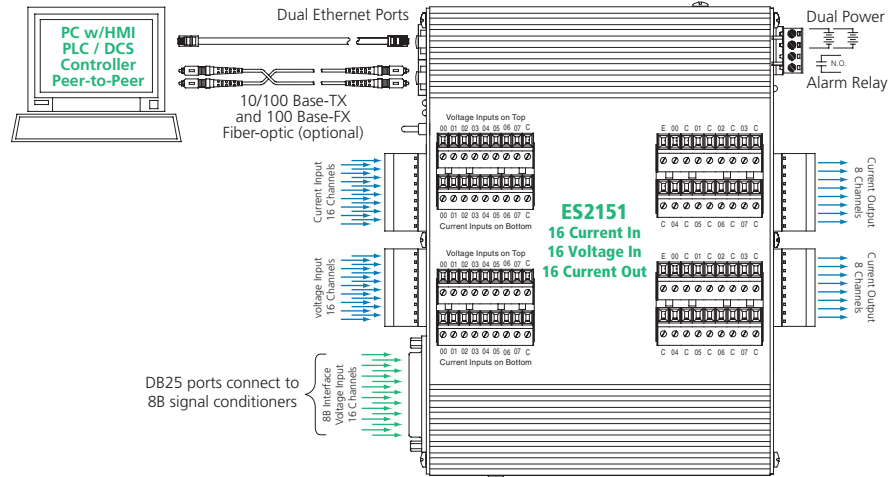


# Ethernet I/O: EtherStax® Series

## ES2151 Ethernet Analog Input/Output Modules

UL LISTED  
/24 HOUR STOCK ITEM  
2 YEAR WARRANTY



32 analog current/voltage inputs ◆ 16 analog current outputs ◆ Modbus TCP/UDP, i2o communication

### Description

These EtherStax I/O units provide a rugged, high-density, and high-speed solution to interface a large quantity of analog input signals. Units accept 16 single-ended analog voltage inputs and 16 single-ended current inputs. The ES2151 also provides 16 analog current outputs. Two DB25 ports support an alternate interface of voltage I/O from 8B input or output modules. This combination of high-density analog inputs and outputs is ideal for many sensor interface applications in remote zones.

EtherStax units are built and tested for high reliability and dependable performance in hostile environments. Available in an aluminum enclosure or as an open circuit board, both formats stack vertically to maintain a very small footprint.



Interface to 8B signal conditioning modules.

### Input Ranges

±5V, ±10V, ±20mA, 0-20mA, 4-20mA DC

### Output Ranges

0-20mA, 4-20mA DC

### Ethernet Communication

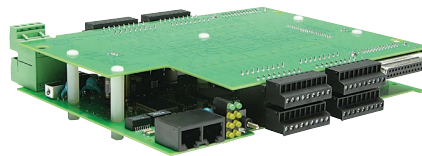
10/100Base-T(X) and 100Base-FX, Automatic MDI/MDI-X on all copper ports, Modbus TCP/IP or UDP/IP protocol i2o peer-to-peer

### Power Requirement

18 to 36V DC (redundancy-ready)

### Approvals

UL/cUL:  
Zone 2, Class 1, Division 2, Groups ABCD



Open circuit board versions are also available.

### Key Features & Benefits

- 48-channel high-density combination of analog inputs and outputs
- DB25 ports for alternate voltage I/O from 8B signal conditioning backpanels
- 4-way isolation and surge suppression
- High-resolution 16-bit A/D and D/A's
- High-speed scanning for 10 millisecond update of all 48 channels
- Automatic zero/span calibration
- Built-in loop-back circuit verifies outputs
- On-demand self-test verifies calibration
- Web browser configuration
- User-configurable sample averaging and integration/totalization function with non-volatile registers
- Dual-format data registers support 16-bit integers or 32-bit floating point
- Scaling registers on all channels
- Peer-to-peer i2o communication with percent-of-span and timed updates

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THE LEADER IN INDUSTRIAL I/O

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# Ethernet I/O: EtherStax® Series

## ES2151 Ethernet Analog Input/Output Modules



### Performance Specifications

#### ◆ Analog Field Inputs

##### Input Channel Configuration

16 single-ended analog voltage inputs and  
16 single-ended analog current inputs.

##### Input Ranges (select on per-channel basis)

±5V, ±10V, ±20mA, 0-20mA, or 4-20mA DC.

##### Input Scaling (per-channel basis)

Floating Point Format: IEEE-754.

##### Input Resolution

16-bit maximum, 0.00166% (1 part in 60,000).

##### Input Accuracy

Current Input: Better than 0.1% of range.

Voltage Input: Better than 0.05% of range.

##### Input Impedance

Voltage: 4M ohms minimum.

Current: 100 ohms.

##### Input Scan Groups and Scan Times

Eight user-enabled 4-channel scan groups. 770µS  
update/group (5mS for all 32 channels) with averaging,  
loopback, and totalization functions disabled.

##### Input Overvoltage Protection

Bipolar Transient Voltage Suppressers (TVS),  
18V clamp level typical.

##### Noise Rejection

CMR (50-60Hz): Better than -72dB.

##### Sample Averaging (user-configurable)

0-500 samples. One register for all channels.

#### ◆ Analog Field Outputs

##### Output Channel Configuration

16 current outputs.

9-16V DC external excitation required.

##### Output Ranges (per-channel basis)

0-20mA or 4-20mA DC sourced.

User-configured on a per-channel basis.

##### Maximum Output Load at Excitation

265 ohms @ 9V.

400 ohms @ 12V.

540 ohms @ 15V.

##### Output Resolution and Accuracy

Resolution: 13-bit maximum, 0.0122%.

Accuracy: Better than 0.1% of range.

#### ◆ Local Alarm Output

##### Configuration

Failsafe or non-failsafe (user-configurable) relay trips on  
power or link-loss failure.

##### Type

SPST-NO, 1 Form A, Class I, Division II approved.

##### Rating

3A @ 24V DC/250V AC, 100,000 cycles general.

2A @ 24V DC/250V AC, Hazardous locations.

##### Maximum Switching Voltage and Power

250V AC / 750VA, 125V DC / 90W.

#### ◆ i2o Peer-to-Peer Communication

Each port of 8 input channels can be mapped to  
output ports of two ES215x units. Updates based on  
time (100mS resolution) or percent of range change  
(0.1% resolution).

#### ◆ Ethernet Interface

##### Internal Switch or Hub/Repeater

Dual-port Ethernet switch. User-configurable as a true  
switch (default mode) or low-latency hub.

##### Network Connector [10/100 Base-T(X)Copper]

One or two 8-pin RJ-45 connectors. Automatic MDI/  
MDI-X. 100m communication distance.

##### Network Connector (100 Base-FX Fiber-optic)

One multi-mode with SC connector. 2km  
communication distance. Full/half-duplex, selectable.

##### Protocols

Modbus TCP/IP, UDP/IP, i2o peer-to-peer.

##### Addressing

StaticIP, DHCP, BootP.

##### Ethernet Modbus TCP/IP Sockets/Sessions

1-10 socket/sessions user-configurable.

##### Ethernet Redundancy

Compatible with STP, RSTP, or any ring scheme.

#### ◆ Environmental

##### Operating and Storage Temperature

Operating: -40 to 70°C (-40 to 158°F).

Storage: -40 to 85°C (-40 to 185°F).

##### Power Requirements

18-36V DC. Redundant, diode-coupled terminals.

4.8W (copper ports), 5.8W (fiber-optic ports).

##### Isolation

I/O, power, relay and Ethernet port-to-port.

Peak: 1500V AC, ANSI/ISA-82.01-1988.

Continuous: 250V AC, 354V DC (150V AC ch-ch).

#### ◆ Enclosure and Physical

##### Housing Classification and Dimensions

IP20: 8.226 x 2.444 x 7.25", 4 lbs. packed.

PCB: 7.920 x 1.875 x 7.25", 1.65 lbs. packed.

##### Safety Approvals

UL/cUL Listed.

Hazardous Locations: Class I; Div 2; A, B, C, D.

Open board units: UL Recognized.

##### Shock and Vibration Immunity (in enclosure)

Mechanical Shock: 50g (3ms), 30g (11ms).

Random Vibration: 5g, (5-500Hz).

### Ordering Information

#### ◆ EtherStax I/O Units

[Go to on-line ordering page >](#)

##### ES2151-0000

Current/voltage inputs, current outputs,  
two Cu ports, IP20 enclosure

##### ES2151-0010

Current/voltage inputs, current outputs,  
two Cu ports, open board (no IP20 enclosure)

##### ES2151-1000

Current/voltage inputs, current outputs,  
Cu & fiber ports, IP20 enclosure

##### ES2151-1010

Current/voltage inputs, current outputs,  
Cu & fiber ports, open board (no IP20 enclosure)

#### ◆ Accessories

Industrial Ethernet Switches

Hardware Accessories and Power Supplies

Software Support

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